GENERAL GYNECOLOGY

Women at risk for sexually transmitted diseases: correlates of intercourse without barrier contraception

Jeffrey F. Peipert, MD, MPH; Kate L. Lapane, PhD; Jenifer E. Allsworth, PhD; Colleen A. Redding, PhD; Jeffrey L. Blume, PhD; Faye Lozowski, BA; Michael D. Stein, MD

OBJECTIVE: The purpose of this study was to evaluate the correlates of vaginal intercourse without barrier contraception (unprotected intercourse).

STUDY DESIGN: Baseline data from a randomized trial were analyzed to evaluate factors that are associated with intercourse without barrier method use among women <35 years old. Logistic regression models provided estimates of the association of demographic, reproductive, and sexual history variables with unprotected intercourse.

RESULTS: Intercourse without barrier contraception was common; 65% of participants had ≥2 episodes of intercourse without barrier contraception use in the past month. Factors that were associated with increased odds of unprotected intercourse included the number of coital episodes, a male partner's unwillingness to use condoms (adjusted odds ratio, 4.1; 95% CI, 2.3-6.9), and, among women <20 years old, low condom use self-efficacy score (adjusted odds ratio, 1.6; 95% CI, 1.0-2.9).

CONCLUSION: Risk factors for unprotected intercourse included coital frequency and the male partner's unwillingness to use condoms. Self-efficacy for condom use was especially important for women <20 years old.

Key words: condom use, contraceptive method, sexually transmitted disease, sexually transmitted infection, unintended pregnancy

Cite this article as: Peipert JF, Lapane KL, Allsworth JE, et al. Women at risk for sexually transmitted diseases: correlates of intercourse without barrier contraception. Am J Obstet Gynecol 2007;197:474.e1-474.e8.

Unintended pregnancy, sexually transmitted diseases (STDs), and the adverse health consequences of STDs are widespread public health problems in the United States and worldwide. An estimated 18.9 million new STD infections, both curable and incurable, occur each year in the United States.[1] Women experience the adverse effects of STDs to a greater degree than men.[2] Thus, it is important to identify methods of prevention to advance the health of women in the United States.

Barrier contraceptive methods (specifically male condoms), when used consistently and correctly, are effective in the prevention of numerous STDs, including HIV.[3] In 2000, the National Institutes of Health released a landmark report on the effectiveness of condoms for prevention. The report summarized the published studies on condom effectiveness as of June 2000,[4] and stated that transmission of *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are reduced by one-half with 100% condom use. A recent report demonstrated a marked reduction of human papilloma virus infection with consistent condom use.[5]

Despite this evidence, US data indicate that individuals who have heterosexual intercourse use condoms consistently only 19% of the time.[6] Among sexually active adolescents, which is the highest risk age group for STDs, only 21% of these adolescents used condoms at last intercourse. One potentially important factor that affects condom use is that many men are unwilling to use them. Some women may be unable to negotiate use because of gender-related power imbalances.[7-9]

There are few studies in the medical literature that have evaluated patient-specific characteristics associated with vaginal intercourse without barrier method use in women who are at risk for STDs and unplanned pregnancy. We sought to address this issue in a baseline analysis of a randomized trial called Project PROTECT. Our hypothesis was that factors that are associated with the number of episodes of intercourse without barrier method use in the past month would vary by age group. We also hypothesized that specific behavior and psychological measures would be associated with vaginal intercourse without barrier method use during the past month.

From the Department of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, MO (Drs Peipert and Allsworth); the Division of Biology and Medicine, Department of Medicine and Community Health, Brown Medical School (Drs Lapane, Blume, and Stein), Rhode Island Hospital (Dr Stein), and Women and Infants Hospital of Rhode Island (Ms Lozowski), Providence, RI; and the Cancer Prevention Research Center, University of Rhode Island, Kingston, RI (Dr Redding).

Received Sep. 15, 2006; accepted Mar. 12, 2007.

This work was supported in part by grants 1RO1-HD36663, Stage-Matched Intervention to Increase Dual Method Use, and K24 HD01298, Midcareer Investigator Award in Women's Health Research, from the National Institutes of Child Health and Human Development.

Reprints not available from the authors.

0002-9378/$32.00

doi: 10.1016/j.ajog.2007.03.032

MATERIALS AND METHODS

Data for the current study were derived from the baseline data collection efforts of Project PROTECT, which was a randomized trial funded by the National Institute of Child Health and Human Development that evaluated the extent to which a computer-based individualized intervention could improve dual contraceptive method use. Trial protocols were approved by the institutional review boards of Women and Infants' Hospital and the University of Rhode Island.

Women who were eligible for Project PROTECT included English-speaking women between the ages of 13-35 years who were competent to give informed consent. Parental consent and minor assent were obtained for all participants who were <18 years old. To be eligible for the study, women had to report sexual activity with a male partner in the past 6 months, to desire to avoid pregnancy for 24 months after randomization, and to test negative for STD outcomes of the study (ie, *C trachomatis*, *N gonorrhoeae*, trichomoniasis, and pelvic inflammatory disease). High-risk women were defined as (1) all sexually active women who were 13-24 years old and (2) sexually active women who were 25-35 years old whose history included any of the following: unplanned pregnancy, history of an STD, inconsistent use of contraception, or other factors that placed a woman at above average risk for unplanned pregnancy or STD (eg, >1 sexual partner in the past 6 months or drug or alcohol abuse).

Recruitment took place between October 1999-October 2003. Potential participants were recruited from primary care, gynecology, and family planning clinics at the 2 hospitals that were involved in the study, and from Planned Parenthood of Rhode Island. Advertisement was done in local city and university newspapers, on local cable and radio stations, and by nurse recruiters who visited local high schools and colleges in the Providence area. Clinicians who treated women who were tested in clinics or urgent care facilities and diagnosed with sexually transmitted infections were also invited to participate after a negative test of cure. During the study, we initiated a "refer-2-friends" program (aka, snowballing) to encourage and improve recruitment. For this analysis, we were interested in women who were sexually active within the 30 days before their baseline visit. We limited our analytic sample to a subgroup of 469 women.

At the time of randomization, all participants completed a self-administered questionnaire and a computer-based survey. The self-administered questionnaire collected information regarding substance abuse, partner violence, and sexual abuse. The computer intervention inquired about STD history, number of sexual partners, frequency of intercourse, and contraceptive behavior that included condom use, partner willingness to use condoms, and participant's self-efficacy (described later).

The participant's perception of her male partner's willingness to use condoms (not at all/not very/sometimes/extremely willing) was assessed. The psychological construct, self-efficacy, or a participant's confidence in her ability to negotiate condom use successfully with her partner across different challenging situations was determined with the use of a 10-item scale that was developed and validated in different samples by Redding et al.[10,11]

The two most common measures of condom use have been proportional (percentage of times a condom was used) or absolute (the number of times a person reported vaginal intercourse with condoms over a specified time period). More recent publications support the absolute measure of condom use.[12-15] As such, we selected as our primary outcome the number of episodes of vaginal intercourse without barrier method use in the past month. We defined the number of episodes of vaginal intercourse without barrier method use in last 30 days as: number of coital episodes – number times condoms were used.

We dichotomized the outcome into 0-1 episodes of vaginal intercourse without barrier method use (zero/low risk) vs ≥2 episodes. This dichotomization was based on clinical relevance with respect to the presumed increased risk of infection with ≥2 episodes of vaginal intercourse without barrier method use in a month. Poisson regression analyses were performed with the use of the number of episodes of vaginal intercourse without barrier method use as the outcome to support associations that were noted with the logistic regression.

Bivariate analyses (χ^2 for categoric variables and *t* test for continuous variables) evaluated the association between demographic, reproductive, and sexual history factors, and ≥2 episodes of vaginal intercourse without barrier method use in the past month. Estimates of odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were derived from logistic regression models, where the dependent variable was at least 2 acts of vaginal intercourse without barrier method use in the past 30 days. We also performed logistic regression analyses that were stratified by age: women who were ≤19 years old, women who were 20-24 years old, and women who were ≥25 years old.[16] ORs were adjusted for demographic, reproductive, and sexual risk factors. Our final model included race/ethnicity, the use of hormonal contraception, a partner's willingness to use condoms, self-efficacy, the number of coital acts in the past 30 days, >1 sexual partner in the past month (yes/no), and having had sex after alcohol use. We evaluated model fit with the use of the *C*-statistic, where values between 0.7-0.8 were considered acceptable, and values between 0.8-1.0 were considered excellent fit. The *C*-statistic for the 3 age groups (≤19, 20-24, and ≥25 years old) was 0.86, 0.82, and 0.77, respectively. SAS software (v 8.2; SAS Institute Inc, Cary, NC) was used to perform the statistical analyses.

RESULTS

The demographic, reproductive, and historic characteristics of the study sample are provided in Table 1. The mean age of participants was 21.9 years. Fifty-four percent of the population was nonwhite; 25% of the population had less than a high school education; 60% of the population had a history of substance abuse; 46% of the population had had a STD, and >50% of the population re-